

Capacitance Acceleration Derivative Detector

Abstract

A capacitance acceleration derivative detector includes a housing, and a first plate fixed within the housing. A second plate is also fixed within the housing and spaced apart from and in parallel relation to the first plate. A flexure plate is disposed between and in substantially parallel relation to the first and second plates. The flexure plate is coupled to the housing along at least an edge. The flexure plate and first plate define a first distance and the flexure plate and the second plate define a second distance. The first and second distances vary in response to acceleration forces acting upon the flexure plate. The flexure plate and the first fixed plate generate a first charge displacement capacitance signal, and the second fixed plate and the flexure plate generate a second charge displacement capacitance signal. A first transimpedance amplifier receives the first charge displacement capacitance signal and generates a first scaled voltage signal therefrom, and a second transimpedance amplifier receives the second charge displacement capacitance signal and generates a second scaled voltage signal

therefrom. An acceleration signal is generated from the first scaled voltage signal and the second scaled voltage signal.